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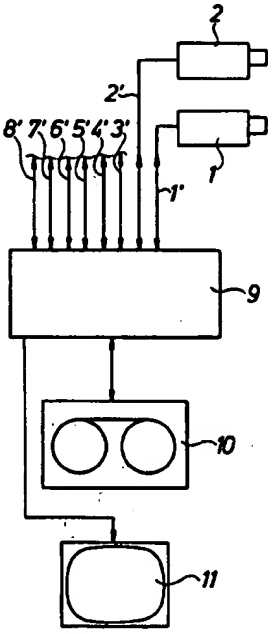
(54) Title: A DEVICE AT TV SURVEILLANCE

(57) Abstract

A device at TV surveillance comprises TV cameras (1, 2, ...), a video tape recorder (10), a switch device for sorting and transmitting the video signals of the different TV camera to the video tape recorder and a supply device for supplying a drive voltage and a synchronizing signal to each TV camera in the same conduit as the video signals are transmitted from each TV camera. The device has a video guard against the lack of a video signal from any TV camera or that the lens of any TV camera is covered and a synchronizing device for the video tape recorder for any possibly non-functioning TV camera. The switch device, the supply device, the video guard and the synchronizing device are all gathered in a recording unit (9). In this unit there is also a device for allowing the supply to a TV monitor (11) of a video signal from at least one TV camera, at the same time as recording by means of the video tape recorder occurs.



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A DEVICE AT TV SURVEILLANCE

Technical Field

The present device relates to a device at TV surveillance, comprising TV cameras, a video tape recorder, a switch device for sorting and transmitting the video signals of the different TV cameras to the video tape recorder, and a supply device for supplying a synchronizing signal to each TV camera in the same conduit as the video signals are transmitted from each TV camera.

Technical Background

It is usual to use TV cameras for surveillance of for example bank and post offices. TV surveillance is also utilized in shops. Several TV cameras can hereby be connected to one video tape recorder.

Such a TV surveillance system may be organized in different ways. Among other things it is important at such systems to provide for a wire laying which is as effective as possible, that a picture quality is attained which is as good as possible, and of course that the security is as good as possible.

In a known system the same conduit in which the video signals are transmitted from each TV camera is used for supplying to the TV camera a drive voltage, for example 35 V, and for a synchronizing signal, so that the right picture from the right camera enters the tape recorder in the right sequence. In such a known system different units or boxes for the switching function and for the supply and synchronizing function are used.

The Invention

A better, cheaper and more advanced device is according to the invention attained in that it comprises a video guard against the lack of a video signal from any TV camera

or that the lens of any TV camera is covered and a synchronizing device for the video tape recorder for any possibly non-functioning TV camera, the video guard and the synchronizing device being arranged in a recording unit together with the switch device and the supply device.

This synchronizing device in the recording unit is arranged to substitute every lacking picture on the tape of the video tape recorder due to a non-functioning TV camera having a certain ordinal number with a picture from the functioning TV camera with highest priority, normally with the highest or lowest ordinal number.

Many TV cameras can be connected to the recording unit, but normally the number is limited to eight. The advantages with the invention can however be utilized already at two connected TV cameras.

The video tape recorder in the system is analogue (which is preferably the case for the entire system) and operates at a lower, for example eight times lower, speed than if an alarm is activated, which leads to a minimizing of the tape consumption.

As a development or modification a device for allowing supply of a video signal from at least one TV camera to a video monitor, which is connected directly to the recording unit, is arranged in the recording unit. This supply occurs concurrently with the recording by the video tape recorder.

In this way the action which is registered by at least one TV camera can be followed in an alarm central without any influence of the recording and with the use of only one recording unit.

The entire TV monitor screen can if desired be filled with the picture from one TV camera, but alternatively pictures from for example four TV cameras can be shown simultaneously on the monitor, so called quad show.

The Drawing

The invention will be further described below under reference to the attached drawings, in which Figs 1 and 2 schematically show a device according to the invention and a modification thereof, respectively.

Description of a Preferred Embodiment

As appears in Fig 1, TV cameras 1, 2 for surveillance of buildings, for example post, bank and shop buildings and the like, are connected to a recording unit 9 by means of conduits 1', 2'. In the drawing further conduits 3' - 8' are indicated, which shall be taken to mean that up to eight TV cameras in the shown case can be connected to the recording unit 9. Up to 16 cameras can also be connected. By the use of so called expansion modules up to 128 cameras can be connected.

The recording unit 9 is connected to a video tape recorder 10, which in turn can be connected to a TV monitor 11.

The video tape recorder 10 is analogue and operates in a certain recording speed for giving satisfactory picture quality only if an alarm is activated. In the normal case it operates at a substantially lower speed for conserving tape. For example it can operate at an eight times lower speed in the normal case than when an alarm is activated. In this way a tape can for example give three hours' recording at an activated alarm but 24 hours' recording in the normal case. An analogue recording gives the best possible picture quality and no digital distortion of the picture information. At a recording "digital signature" can be stored on the video tape, which gives information about which camera the picture emanates from and if an alarm is activated for this camera. This signature is used at playback in order to only show pictures from one camera at a time.

In the respective conduit 1', 2' to the recording unit 9 a video signal is transmitted from each operating TV camera 1, 2. In the opposite direction from the recording unit 9 to the respective TV camera 1, 2 a drive voltage, for example 35 V, is transmitted in the same conduit 1', 2' to the TV camera as well as a synchronizing signal, so that the different cameras operate in phase with each other.

The recording unit 9 also contains two further functions, namely a video guard and a synchronizing device for the video tape recorder 10. The video guard is designed to tell whether video signal is lacking from any TV camera or whether the lens of any TV camera is covered. At for example robberies it is namely not unusual that the robber tries to damage a TV camera or to cover its lens. The synchronizing device has as its purpose to see to it that the synchronization in the video band recorder in a way described below is not disturbed in spite of the fact that a certain TV camera is non-functioning.

By means of the tape recorder 10 sequencies of pictures from the different connected TV cameras are recorded on one single video tape. Singular pictures from all connected cameras are stored on the video tape, and this is done in the following sequence, when for example eight cameras are connected: 8-7-6-5-4-3-2-1-8-7... The number of cameras and the operational speed of the tape recorder determine how often pictures from the different cameras are recorded on the tape. If six cameras are connected to the recording unit 9 it is for example at normal operation possible to obtain one picture per second from each camera, whereas eight pictures per second from each camera can be recorded at an alarm situation.

The synchronizing device for the video tape recorder functions in such a way that if a camera has been damaged by shooting, damaged in any other way or been covered and accordingly a video signal from this camera is lacking, the

camera with the highest ordinal number or the highest priority is automatically connected instead of the damaged camera. If for example there are six cameras in the sequence 6-5-4-3-2-1-6-5..., camera 4, if this camera has been damaged, will be changed to camera 6, so that the sequence becomes 6-5-6-3-2-1-6-5-6-3-2...

The camera with the lowest ordinal number or any chosen camera can alternatively be given the highest priority.

Concluding, sequences of pictures from several TV cameras, which can provide pictures in colour and/or black and white, are continuously recorded on one video band. The recording occurs normally at a lower speed, and at an alarm the recording increases to full speed. On the video tape entire pictures from the different cameras are continuously stored in a continuously repeated sequence. At playback the personnel can in a simple way choose the pictures which shall be used on the monitor without disturbance of the monitor picture from other recorded pictures. Police can survey the video band with a so called digital photo lab by connecting the system to an upgraded PC and can in this way "electronically" enlarge and improve all recorded picture sequences.

At the device according to Fig 1 several functions are gathered in one unit. A couple of these functions have already been present at earlier used systems, whereas the others are new. The device provides an extremely cost effective and secure solution, at the same time as the handling becomes very simple for the personnel.

In Fig 2 a modified device according to the invention is shown.

In this modification, which in all other respects than stated below is as the device according to Fig 1, the TV monitor 11 is connected directly to the recording unit 9 (and not via the video tape recorder 10). Signals from the

video tape recorder 10 are accordingly transmitted at playback via the unit 9 to the TV monitor 11.

The drive voltage to the respective TV camera 1, 2 can further be supplied in separate conduits instead of in the conduits 1', 2'.

In this modified device according to Fig 2 it is possible in the recording unit 9 to have a device, by means of which concurrently with recording in the way described above and independently thereof a video signal from at least one TV camera 1, 2 is transmitted directly to the TV monitor 11. On the monitor it is accordingly possible to survey the action registered by a TV camera synchronously. The analogue signal from the TV camera can preferably be digitalized, before it is sent to the monitor. The picture from one TV camera can be shown on the monitor, or alternatively pictures from four, nine or even 16 cameras can be shown on the monitor in a "chess pattern".

This possibility to view picture sequences from cameras concurrently with recording is of a special value in manned alarm centrals.

The TV monitor 11 can be used both for the concurrent surveillance described above and for later playback of sequences recorded on the video tape recorder.

CLAIMS

1. A device at TV surveillance, comprising TV cameras (1, 2, ...), a video tape recorder (10), a switch device for sorting and transmitting the video signals of the different TV cameras to the video tape recorder, and a supply device for supplying a synchronizing signal to each TV camera in the same conduit as the video signals are transmitted from each TV camera, c h a r a c t e r i z e d by a video guard against the lack of a video signal from any TV camera (1, 2, ...) or that the lens of any TV camera is covered and by a synchronizing device for the video tape recorder (10) for any possibly non-functioning TV camera, the video guard and the synchronizing device being arranged in a recording unit (9) together with the switch device and the supply device.

2. A device according to claim 1, c h a r a c t e r i z e d in that the synchronizing device in the recording unit (9) is arranged to substitute every lacking picture on the tape of the video tape recorder (10) due to a non-functioning TV camera (1,2,...) having a certain ordinal number with a picture from the functioning TV camera with highest priority, normally with the highest or lowest ordinal number.

3. A device according to claim 1, c h a r a c t e r i z e d in that up to sixteen, but normally eight, TV cameras (1, 2,...) are connected to the recording unit (9).

4. A device according to claim 1, c h a r a c t e r i z e d in that the video tape recorder (10), which is analogue, in normal operation operates at lower, for example eight times lower, speed than if an alarm is activated.

5. A device according to claim 1, c h a r a c t e r i z e d in that a device for allowing supply of a video signal from at least one TV camera (1, 2,...) to a TV moni-

tor (11) which is connected directly to the recording unit (9), is arranged in the recording unit and that this supply occurs concurrently with the recording by the video tape recorder (10) (Fig 2).

6. A device according to claim 1, c h a r a c t e r i z e d in that pictures from for example four TV cameras (1, 2, ...) can be shown simultaneously on the TV monitor (11).

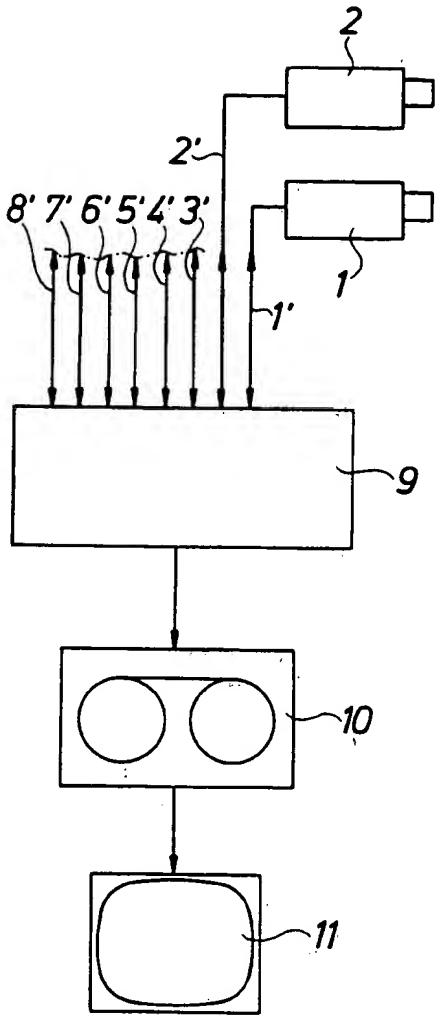

FIG. 1

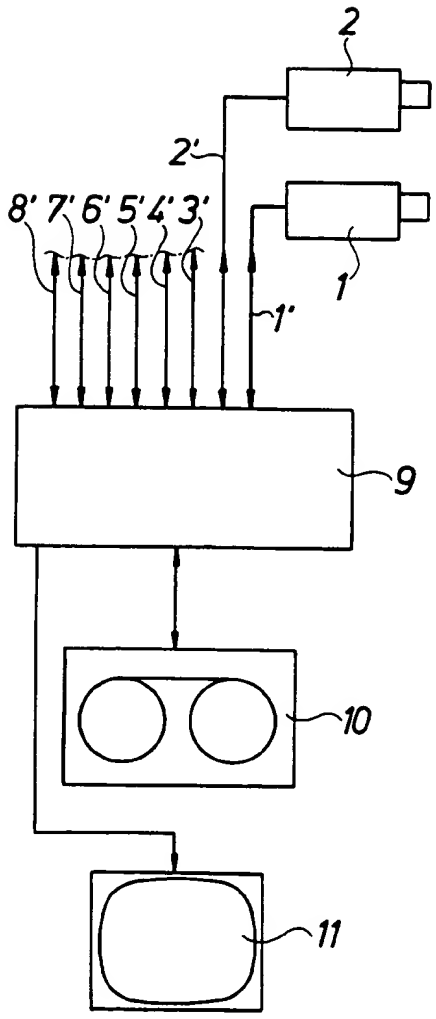

FIG. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 95/00863

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04N 7/18, G08B 13/196
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04N, G08B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0149569 A2 (SOCIETE NOUVELLE JULES VERGER ET DELPORTE), 24 July 1985 (24.07.85), abstract --	1-6
A	EP 0137320 A2 (ATIS ASSMANN GMBH), 17 April 1985 (17.04.85), abstract --	1-6
A	GB 2082869 A (SHORROCK SECURITY), 10 March 1982 (10.03.82), figures 1-3, abstract -- --------	1-6

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

02/10/95

International application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A2- 0149569	24/07/85	FR-A,B- 2558286	19/07/85
EP-A2- 0137320	17/04/85	DE-A- 3333078	21/03/85
GB-A- 2082869	10/03/82	NONE	